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THE HUMANIZED MINERAL WORLD: WEB-BASED COMMON RESOURCES

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Introduction

There is a growing uptake of natural resources by human societies. The roots and beginning of this process is studied by special branches of prehistoric archaeology, archaeometry and cultural anthropology. We are interested in what and why, as well as where from and we are always getting only a part of the possible answer.

The knowledge of the prehistoric communities of the surrounding world was essential for their survival. They accumulated this knowledge over generations. For archaeologists dealing with the same problem, it is imperative to know as much of the location, availability, quality of these past resources as possible to reconstruct past activities and history.

There are many contraversies hidden in this approach. We are confronted with a selective fossilisation of evidence, the similarity of different materials which could, or could not be allocated to source regions, the total or partial exploitation of former resources, the destruction of original raw material sources by subsequent quarrying or construction and many other things.

As a rule, we are left with a very small and imperfect selection of the products, worked, used and traded in prehistory. It is even more important therefore collectively to know and access as much information as possible. Easily accessible common resources on the Web can be a solution.

1 - Spatial, temporal, material framework

The present initiative by the organisers of the meeting focused on the investigation of humanised mineral resources from prehistoric South-Eastern Europe. This is a large enough unit connected by seemingly strong ties in prehistory. The distribution of certain material and cultural features - i.e., obsidian, spondylus and spreading of ideas - housing and farming serve, in a way, as a natural background for possible collaboration. The time period for the early exploitation of mineral and natural resources necessarily point to "lithic" periods in the first place.

The starting point for what we can actually study is necessarily the specific range of materials we can find on archaeological sites. Recently, on the occasion of a national project in Hungary[1] we tried to survey sourceable and mappable goods on prehistoric sites and ended up with a list of about 200 categories we could differentiate and, more or less, attribute to some region within Hungary and its immediate environment.

2 - Web-based resources - pro and contra

Modern information technology, especially the internet is a great challenge for all disciplines including the humanities. It has immense possibilities for expressing thoughts and ideas in a fast, instructive and accessible way. At the same time, the ephemeral character, the unsolved questions of intellectual property rights and consequently uncertain status of web-based publication prevent a lot of good content from being immediately accessible.

The scientific community has to realize that the methods of knowledge acquisition are changing dramatically and if we want to keep our role in directing opinions concerning our specific subject, we must provide good and accessible data on our own professional work

- for the general public (whom we owe responsibility, in presentation as well as forming opinions)

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[1] OTKA- T 025086, Atlas of prehistoric non-metallic raw materials in the Carpathian Basin

- for the generations of students, raised on modern IT
- for ourselves - to make our work better and more efficient.

3 - Current examples, world-wide

To the best of my knowledge, so far there is no web-page or portal systematically dedicated to humanised mineral resources. One of the (regional?) aims of our collaboration can be to create one. However, there are a number of good sites all over the world dealing with some aspects of the problem. Such is, for example flintsource.net [http://www.flintsource.net/], which is - apart from giving first-hand information on some important natural resources mainly used for the production of chipped stone tools - also provides an extensive bibliography on the subject as well as a link to related subjects. Other specific materials like obsidian [http://www.peak.org/obsidian/], amber [http://www.brost.se/eng/welcome/index.html] or salt [http://www.saltinstitute.org/38.html] also have an extensive world-wide network - which cannot all be mentioned in this article. A formerly available interesting site on spondylus [http://www.spondylus.net/] known to the author is currently under re-construction, and is an example of the transitional character of e-information; hopefully by the time of publication, it will be functioning again.

4 - Hungarian practice

Spreading information on the net was rapidly adopted in Hungary. Especially good services are provided for electronical text archives [http://mek.oszk.hu/] and collective portals [http://www.startlap.hu/], having specific pages devoted to archaeology [http://regeszet.lap.hu/] and geology [http://földtan.lap.hu/] as well. Individual institutes dealing with the subject have their own information services, such as the Hungarian Geological Survey [http://www.mafi.hu/], the Archaeological Institute of the Academy [http://www.archeo.mta.hu/] and the Archaeolgical Institute of the University [http://www.btk.elte.hu/regint/].

Museums typically have their own data service; a portal-type site[http://www.museum.hu/] covers those which do not intend to run their own info. The individual data service of museums is incorporated within the framework of Virtual Library Museum Pages [http://icom.museum/vlmp/] by the *ace* server.

5 - Data services on *ace* server

Most information regarding the humanised mineral world in Hungary is mediated by the *ace* server [http://www.ace.hu/]. This is the server of the Archaeocomp Association, a small non-profit scientific association dealing with an interdisciplinary approach to archaeology, mainly introduction of IT and sciences to the field. The data service of the Association was recently revised and reported on in the framework of Networkshop 2003, the annual meeting of networking and IT applications in the academic sphere in Hungary (Biró *et al.* 2003). The specific data services regarding petroarchaeology were presented on the VIIIth Flint Symposium, Bochum (1999; Biró in press). These services still function, and have been completed by a recent major project, the Atlas of prehistoric non-metallic raw materials in the Carpathian Basin.

The oldest of our data service is the exhibition guide of the Szentgál-Tuzköveshegy flint (radiolarite) mine [http://www.ace.hu/szentgal/], the first electronic exhibition guide in Hungary (Biró-Regenye 1995). The original version was made in DOS-based hypertext, published on CD in two editions, and later migrated to web in its current form. It is a good example how to make standard publication (on CD) available to a wider public.

The other application with a considerable tradition is our Lithotheca [http://www.ace.hu/litot/]. This is also a two-media publication, the Catalogues published in standard printed version in English (Biró-Dobosi 1991, Biró-Dobosi-Schléder 2000) while the web version contains the main data base of the collection representetive for the chipped stone tool raw materials in Hungary in two languages, English and Hungarian, supported by colour-coded true colour images which are very important for the study of lithic raw materials and cannot be generally realised in printed books because of the costs of reproducing coloured images.

We were also happy to host the project webpage of UNESCO IGCP-442 [http://www.ace.hu/igcp442/], entitled "Raw materials of the Neolithic/Aeneolithic polished stone artefacts: their migration paths in Europe". This was the first interdisciplinary project between geology and archaeology supported by UNESCO. The leaders of the project were Dusan Hovorka (geologist, Bratislava University) and Gerhard Trnka (archaeologist, Vienna University). During the operation of the project (1999-2002), a lot of good content available also in electronical form was produced. We are still working on final publications and hope to extend the web-page accordingly.

The biggest project we started on the *ace* server is the Atlas... project [http://www.ace.hu/atlas/], devoted to the study of humanised mineral resources in Hungary. This project was supported by the

Hungarian National Grant Foundation (OTKA, project nr. T-025086). The official duration of the program was 1998-2002, however we are still working on some parts especially the electronic publication of the results. Apart from the author (basically with an archaeological background, affiliated to the Hungarian National Museum), the key persons of the project included György Szakmány, a petrologist from ELTE University and the regional-mapping geologist Péter Scharek from the Hungarian Geological Institute. All of us have considerable experience in archaeometry and the scientific (basically, geological) study of archaeological finds.

The idea was to collect and locate mappeable archaeological, geological and analytical data on prehistoric material culture from Hungary. Evidently we cannot do much with very general categories without provenance information. Also there is a natural biass towards the lithic periods we know much more about.

As a starting point we listed (and revised many times) the different kinds of raw materials we can separate and locate to sources on prehistoric archaeological sites. The source location information was collected on the basis of previous provenance studies, the digital geological map of Hungary (scale 1:500 000) and, for the Carpathian Basin, the map and catalogue of the Hungarian stone quarries produced in 1904 (Schafarzik 1904). The analytical data and distribution data were partly from our own practice and observations and partly from technical literature. The structure of the Atlas follows the main functional categories (Fig. 1). Within each category, the raw materials encountered and distinguished so far on archaeological sites are listed (Fig. 2).

The individual raw materials are described, shown on images (macroscopic and microscopic) and maps of distribution in respect of the sources and the archaeological/analytical distribution data, if available (Fig. 3).

Though collection of the data proceded simultaneously, the construction of the web pages is a slow process because we had to re-structure the information several times. As of today, the sheets on chipped stone tools and polished stone tools are more or less finished while we are working on the rest.

6 - Future perspectives

The data behind the Atlas are collected on several sheets and a growing unified database. For the

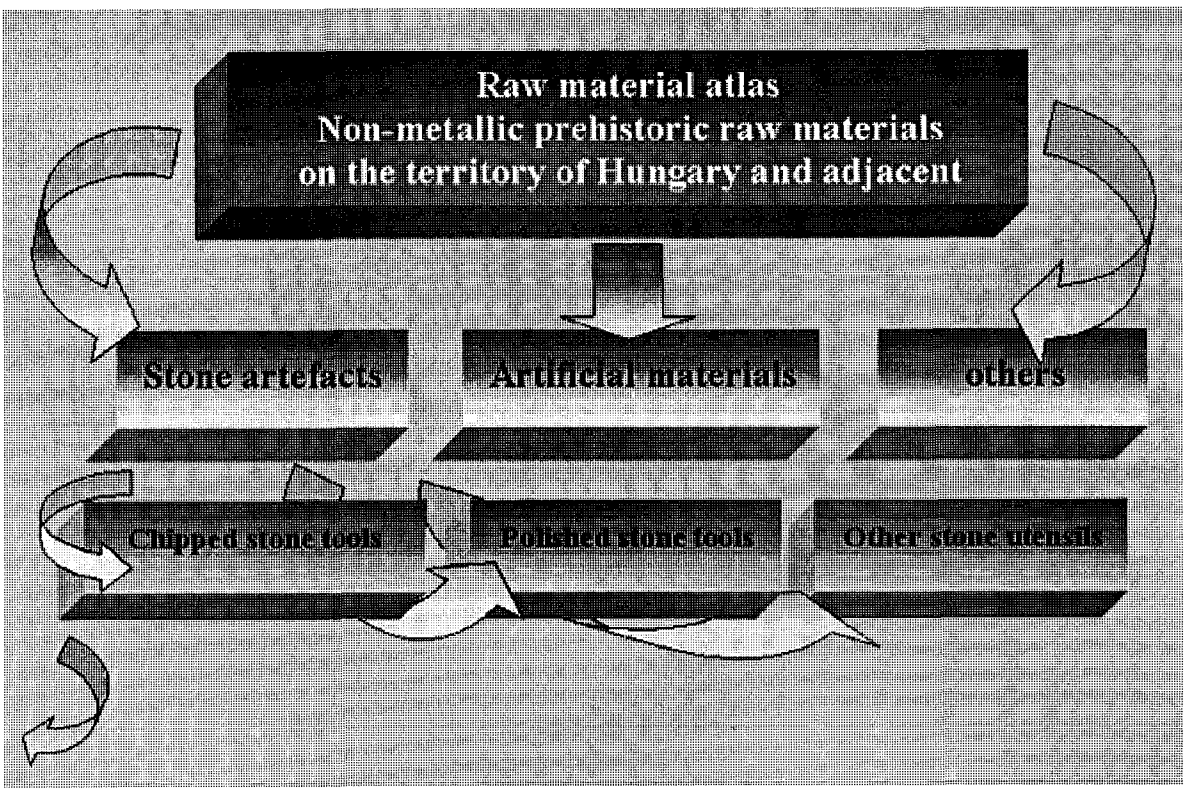

Figure 1. Structure of the Atlas (screen shot from the Atlas).

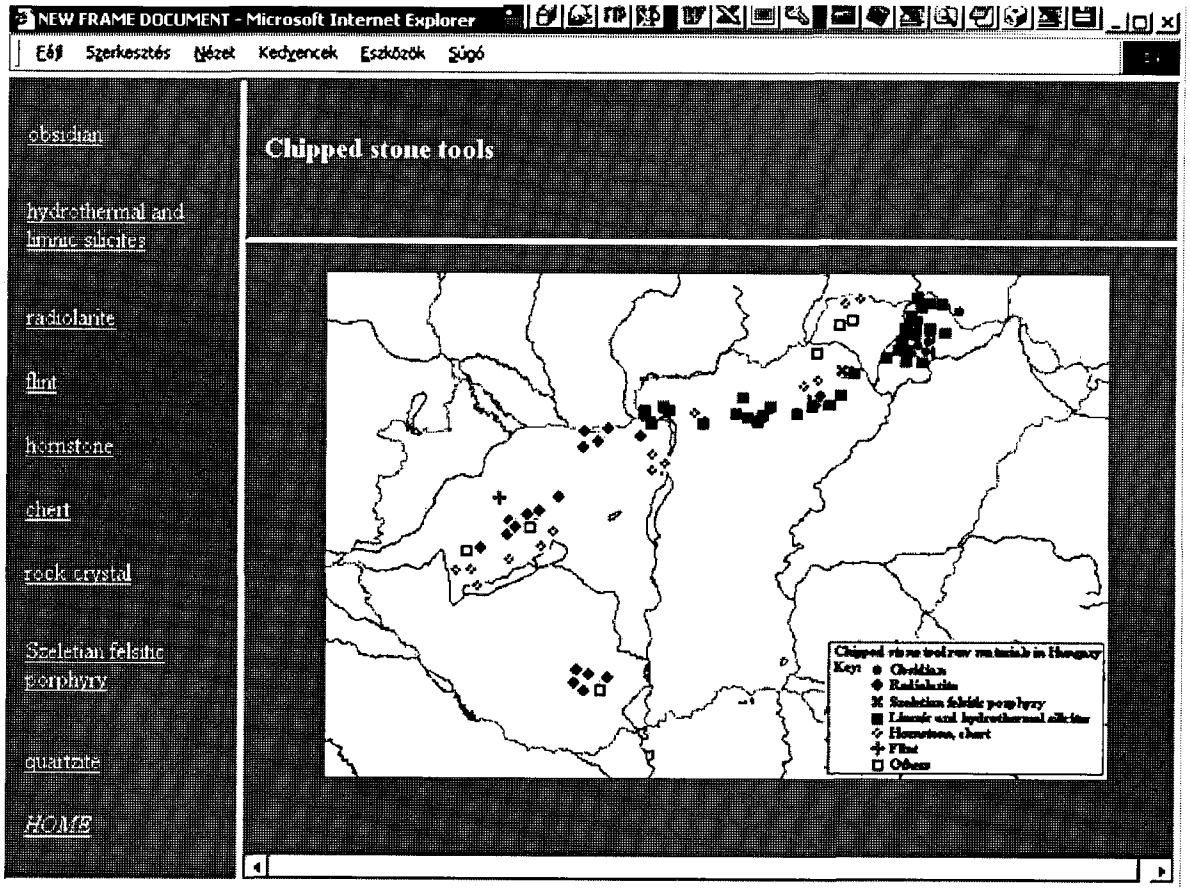

Figure 2. Categories separated within one unit: example, chipped stone tool raw material (screen shot from the Atlas).

time being, the images and the maps are static and the presentation of the evidence follows a hierarchical scheme. As time goes by and we complete all sheets in preparation we may venture a dynamical database with on-line maps, however our complexity and technical background is not enough for such service as yet.

Also, we would appreciate collaborating with other sites of similar or partly similar scope.

Collaboration with South-East European countries for the study of the humanised mineral world is just a rational step in this direction.

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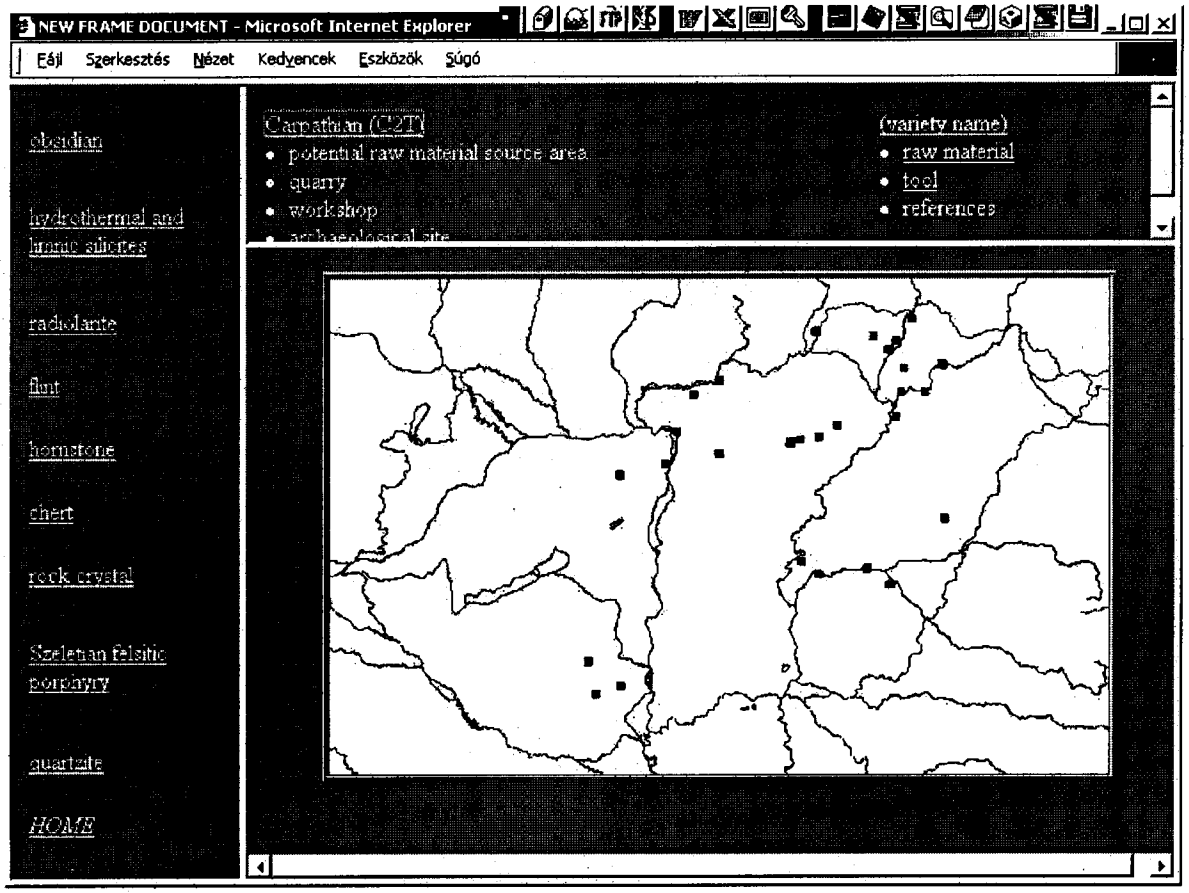

Figure 3. Distribution of individual raw material types, example, Carpathian 2T obsidian (screen shot from the Atlas).

SCHAFARZIK F., 1904. *A magyar szent korona országainak területén létezõ kõbányák [Stone quarries existing on the territory of the countries under the Hungarian Crown]*, Budapest.